proper filtration,.and good management.

Several companies supply line-source drip tubing with orifice spacings from 8 to 36 inches. The discharge rate per 100 feet of tubing depends on the size and spacing of the orifices and on line pressure. Most systems are designed to operateat pressures from 7 to 10 pounds per square inch (psi). These systems should be used in fields with level in-row slopes or only a slight downhill slope from the header pipe. Row length must also be limited to insure reasonably uniform water distribution. Reuse of most drip tubing is impractical because of handling and water delivery problems. Lay-flat hose, a low-pressure type of hose that flattens when water is not being pumped, is often used for header or supply lines and is usable for several seasons. On sloping terrain it may be necessary to install pressure regulators in the main line and header pipe to obtain the proper pressure on each row lateral.

For more information on trickle irrigation, contact your county Extension agent and ask for a mimeographed article called "Trickle Irrigation.--

Irrigation System Design. Some basic principles must be followed in designing irrigation systems. To insure uniform water application, friction loss in the lateral line (the sprinkler line or drip tubing) should not exceed 20 percent of the recommended sprinkler or drip tube operating pressure. The distance between sprinklers should not exceed **60** percent of the rated sprinkler diameter. Main and supply lines and header pipes must be large enough to deliver water to all laterals and sprinkler heads at the required operating pressure. The pump capacity needed will be determined by the rated flow from operating sprinklers or drip lines. In determining the necessary pump pressure, you must take into account sprinkler or drip line pressure, friction losses in main and lateral lines, and elevation differences.

A reputable irrigation dealer or consultant should be contacted for help in designing a system that will use water and energy efficiently. Remember that the initial purchase price is only part of the total cost of owning the system. The operating cost over the life of the system can be several times the initial purchase price.

Operating an Irrigation System. Irrigation scheduling should be based on soil moisture level, which can be determined with tensiometers or electrical resistance blocks. Tensiometers measure moisture tension and work best in light-textured (sandy) soils. Electrical resistance blocks depend on electric current flow between electrodes in a ceramic block buried in the soil. They work better in soils with heavier textures. Tensiometers may cost $25 or more each and can be used for several years. Electrical resistance blocks may cost only $3 to $6 each but are usable only one year. A meter, required for use with the resistance blocks and usable for several years, may cost $250 to $450. You may need to seek technical advice on the calibration and use of tensiometers and resistance blocks in scheduling irrigation.

Sprinkler irrigation must be coordinated with pesticide spray and harvesting schedules. Irrigate, if needed, just after spraying fungicides so that protection against disease organisms is on the plants when they are wet. Respray fungicides as soon after irrigation as possible to provide continuous protection. Irrigate after harvesting or other cultural operations to minimize traffic in the field while the soil and foliage are wet. Sprinkler irrigation should be done at midday if possible so that the foliage will have a chance to dry before nightfall. Keeping plants continuously wet in early morning or late evening favors disease development.

The rate and frequency of water application will depend largely on soil type, stage of growth, and weather conditions. Light (sandy) soils have a higher water absorption rate but less water-holding capacity than heavy (clay) soils. Therefore, higher application rates (more gallons per minute) may be used safely on the lighter soils, but more frequent applications may be needed than with heavier soils. As plants become larger, they use more water. Also, during hot, breezy, low-humidity weather plants use more water, and more water evaporates from the soil surface. Under these conditions, you will have to irrigate more often to maintain optimum soil moisture level. During the fruiting season, water use may be as high as 1.5 inches per week or 0.2 to 0.25 inches per day, depending on weather conditions.

The amount of water to apply (the number of inches per acre) during any application depends on system efficiency as well as plant need. Sprinkler irrigation is only about 75 percent efficient, so the amount of water applied must be one-third greater than the plants' actual water need. Making two small applications per week is better than applying the total amount at one time. With drip irrigation, which is less dependent on crop management operations, applications can be made daily, if needed, to maintain the moisture at optimum level. Drip irrigation systems require less water than overhead systems to maintain optimum soil moisture level.

Sprayers

A good sprayer (of the mist blower or high-volume type) is necessary for adequate control of diseases and insects.

The essential components of a high-volume sprayer are a piston or